CLAIMS

What is claimed is:

1. A transceiver system comprising:

a first passband single carrier transmitter coupled to a first ultra-wide-band wireless transmission channel; and

a first receiver coupled to said first ultra-wide-band wireless transmission channel, wherein said first receiver receives signals transmitted by said first passband single carrier transmitter over said first ultra-wide-band wireless transmission channel at a baud rate less than or equal to half of a spectral bandwidth of said signal transmitted by said first passband single carrier transmitter.

2. The transceiver system according to claim 1, wherein said first passband single carrier transmitter and said first receiver coupled to said first ultra-wide-band wireless transmission channel is a first piconet.

3. The transceiver system according to claim 2, further comprising:

a second passband single carrier transmitter coupled to a second ultra-wide-band wireless transmission channel; and

a second receiver coupled to said second ultra-wide-band wireless transmission channel, wherein:

said second receiver receives signals transmitted by said second passband single carrier transmitter over said second ultra-wide-band wireless transmission channel at a baud rate less than or equal to half of a spectral bandwidth of said signal transmitted by said second passband single carrier transmitter; and

said second passband single carrier transmitter and said second receiver coupled to said second ultra-wide-band wireless transmission channel is a second piconet, wherein said second piconet is adjacent to said first piconet.

4. The transceiver system according to claim 2, wherein said first passband single carrier transmitter transmits data within said first piconet at a first symbol rate and said second passband single carrier transmitter transmits data within said second piconet at a second symbol rate.

5. The transceiver system according to claim 1, wherein said first passband single carrier transmitter within said first piconet scans channels to determine symbol rates that are being utilized in neighboring piconets.

6. The transceiver system according to claim 5, wherein said first passband single carrier transmitter within said first piconet selects for use a symbol rate that differs from said determined symbol rates that are being utilized in said neighboring piconets.

7. The transceiver system according to claim 1, wherein said first passband single carrier transmitter comprises an encoder that encodes bits to be transmitted in said transmitted signals with a code rate R, where $R < 1$.

8. The transceiver system according to claim 7, wherein said first passband single carrier transmitter comprises an interleaver that interleaves said encoded bits so that adjacent encoded bits are mapped to symbols widely separated in time in said transmitted signals.

9. The transceiver system according to claim 1, wherein said first receiver comprises a channel matched filter sampled at a symbol rate.

10. The transceiver system according to claim 9, wherein said first receiver comprises a symbol-spaced linear equalizer sampled at said symbol rate.

11. A method for communicating information wirelessly, the method comprising:

transmitting signals via a first passband single carrier transmitter coupled to a first ultra-wide-band wireless transmission channel; and

receiving said transmitted signals by a first receiver coupled to said first ultra-wide-band wireless transmission channel, wherein said first receiver receives signals transmitted by said first passband single carrier transmitter over said first ultra-wide-band wireless transmission channel at a baud rate less than or equal to half of a spectral bandwidth of said signal transmitted by said first passband single carrier transmitter.

12. The method according to claim 11, wherein said first passband single carrier transmitter and said a first receiver coupled to said first ultra-wide-band wireless transmission channel is a first piconet.

13. The method according to claim 12, further comprising:

coupling a second passband single carrier transmitter to a second ultra-wide-band wireless transmission channel;

coupling a second receiver to said second ultra-wide-band wireless transmission channel; and

receiving by said second receiver, signals transmitted by said second passband single carrier transmitter over said second ultra-wide-band wireless transmission channel at a baud rate less than or equal to half of a spectral bandwidth of said signal transmitted by said second passband single carrier transmitter, wherein:

said second receiver receives signals transmitted by said second passband single carrier transmitter via said second ultra-wide-band wireless transmission channel at a baud rate less than or equal to half of a spectral bandwidth of said signal transmitted by said second passband single carrier transmitter, and

said second passband single carrier transmitter and said second receiver coupled to said second ultra-wide-band wireless transmission channel is a second piconet, wherein said second piconet is adjacent to said first piconet.

14. The method according to claim 12, further comprising:

transmitting data within said first piconet at a first symbol rate by said first passband single carrier transmitter; and

transmitting data within said second piconet at a second symbol rate by said second passband single carrier transmitter.

15. The method according to claim 11, further comprising scanning channels by said first passband single carrier transmitter within said first piconet to determine symbol rates that are being utilized in neighboring piconets

16. The method according to claim 15, further comprising selecting for use a symbol rate that differs from said determined symbol rates that are being utilized in said neighboring piconets by said first passband single carrier transmitter within said first piconet.

17. The method according to claim 11, further comprising encoding bits to be transmitted in said transmitted signals by an encoder integrated within said first passband single carrier transmitter with a code rate R, where $R < 1$.

18. The method according to claim 17, further comprising interleaving said encoded bits by an interleaver integrated within said transmitter so that adjacent encoded bits are mapped to symbols widely separated in time in said transmitted signals.

19. The method according to claim 11, further comprising sampling a channel matched filter integrated within said first receiver at said symbol rate.

20. The method according to claim 19, further comprising sampling a symbol-spaced linear equalizer integrated within said first receiver at said symbol rate.

21. A transceiver system, comprising:

a passband single carrier transmitter coupled to an ultra-wide-band wireless transmission channel, wherein said passband single carrier transmitter modulates a signal at a baud rate such that any spectral region of the signal is transmitted substantially by at least two spectral regions separated by integer multiples of the baud rate; and

a receiver coupled to said ultra-wide-band wireless transmission channel, wherein said receiver receives signals transmitted by said passband single carrier transmitter over said first ultra-wide-band wireless transmission channel and processes said at least two spectral regions to coherently sum said at least two spectral regions.

22. A method for communicating information in a wireless channel, the method comprising:

transmitting, using a passband single carrier transmitter, a symbol stream to a lossy ultra-wide-band wireless transmission channel at an adaptively chosen baud rate that is based on said lossy ultra-wide-band wireless transmission channel, said adaptively chosen baud rate varying over a range that includes baud rates less than or equal to half of a spectral bandwidth of said transmitted symbol stream.

23. The method according to claim 22, further comprising receiving said transmitted symbol stream from said lossy ultra-wide-band wireless transmission channel.

24. The method according to claim 22, further comprising transmitting error-sensitive data at a lower baud rate that is utilized to transmit less error-sensitive data over said lossy ultra-wide-band wireless transmission channel.

25. A method for communicating information in a wireless channel, the method comprising:

receiving a symbol stream from a lossy ultra-wide-band wireless communication channel, wherein said symbol stream is transmitted from a passband single carrier transmitter at an adaptively chosen baud rate that is based on said lossy ultra-wide-band wireless transmission channel, said adaptively chosen baud rate varying over a range that includes baud rates less than or equal to half of a spectral bandwidth of said transmitted symbol stream.

26. A communication system, comprising:

a receiver coupled to an ultra-wide-band wireless transmission channel that receives signals transmitted by a passband single carrier transmitter at a baud rate less than or equal to half of a spectral bandwidth of said signals transmitted by said passband single carrier transmitter.